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Introduction to the Special Issue on Web-Based Technologies

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The infusion of Web-based technologies into every part of our social and work lives presents enormous opportunity for new approaches to personnel preparation, professional development, collaboration among team members, and the delivery of services to young children and their families. For example, in preservice education, geography or the knowledge base of program faculty can limit the scope of students' training. With Web-based technologies, such as online videos, synchronous conferencing, and participation in social networks, however, students are exposed to a whole host of new ideas, issues, people, and effective practices.

Professional development efforts can also be enhanced through the use of Web-based technologies. For example, on-demand training materials and resources can easily be posted to blogs, Web sites, and/or collaborative spaces, such as Google groups. In addition, through the use of videoconferencing, cyber-consultation can increase the frequency and access of providers to experts and mentors. The efficiency and degree of collaboration among team members may be enhanced by Web-based technologies. For example, wikis and blogs allow teams to be apart physically, but to co-construct reports, develop Individualized Family Service Plans (IFSPs) and Individualized Education Plans (IEPs), or even to communicate the happenings of the school day with families.

Finally, there is potential for the delivery of services to be enhanced through the use of Web-based technologies. Many early childhood assessments, for example, now have associated database management systems that allow for aggregating observations, monitoring individual and group child performance, and data-driven decision making. Collecting authentic samples of children's behaviors is also easier through such systems as the Language Environment Analysis System (LENA). Other technologies, such as Smartboards, are allowing providers to represent critical concepts and skills in multiple ways and to provide children with multiple opportunities to express their ideas and participate in daily routines.

Because Web-based technologies are evolving so quickly, promising new applications emerge at a pace that far surpasses the capacity of the field to fully study the effectiveness of each application before implementation. In our own work we have used class and student blogs to promote reflection and critical thinking. Although data on whether or how blogs increase such student attributes are still emerging, initial indicators of effectiveness and suggestions for application can be used to build an evidence base for promising practices.

In this special issue, we aim to guide readers to ask directed and poignant questions regarding the efficacy of Web-based technologies. For example, rather than asking "Are Web-based technologies as effective as on-ground or face-to-face practices?" we encourage questions such as "What are the critical features of Web-based technologies that create an effective learning experience for preservice teachers?" In addition, this issue provides initial research that builds our knowledge and evidence base regarding applications of various Web-based technologies.

The articles described next and contained in this issue represent a continuum of levels of evidence regarding the application of Web-based technology in our field; they range from a case illustrating online decision making to remote coaching in applied settings, with additional evidence provided by a randomized-control trial design. Together, the articles offer evidence of promising practices immediately applicable to our field; they also suggest important questions to be pursued through further lines of inquiry.

A Web-Based Tool to Support Data-Based Early Intervention Decision Making

In this article, Buzhardt, Greenwood, Walker, Terry, and Garrett describe the Making Online Decisions (MOD) system. Using a case study of a home visitor who needs to make intervention decisions regarding a young child's communication, the authors illustrate how systematic observations entered into a Web-based system can guide teams through a decision-making process. The open-source technology used by the MOD further illustrates how accessible and usable Web-based data management systems are becoming and how professional judgment, data, and important decisions can be merged into a doable process of asking

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questions and receiving data-driven and evidence-based answers. The authors further highlight how the MOD system can be used at a program, state, or federal level in terms of accountability requirements specifically through the maintenance of each provider's progress monitoring, intervention selection, decisions, and intervention implementation efforts.

Using Desktop Videoconferencing to Deliver Interventions to a Preschool Student With Autism

In this article, Gibson, Pennington, Stenhoff, and Hopper evaluate the impact of functional communication training (FCT) on the elopement of a preschooler with autism. A preschool teacher and assistant participated along with a 4-year-old boy who attended the half-day inclusive preschool program. An ABAB design was used to examine the relationship of FCT on reducing elopement during circle time. Teacher training/consultation and data-collection efforts were conducted using free desktop videoconferencing software called Skype™. Findings indicate that elopement was reduced as a result of implementing FCT during each intervention phase. Although not controlled for as part of the single-subject study design, the authors do provide promising evidence that training on consultation related to FCT can be delivered through desktop conferencing, that teachers implemented the training with fidelity following training received via Skype™, and that they were satisfied with the process. Implications for practice, particularly with regard to the use of a free Web-based technology to deliver training and consultation, include possible increases in access and amount of consultation providers receive and acknowledgment that minimal investment in equipment, software, or training on the technology may be needed to reap critical benefits.

Technologies for Expanding the Reach of Evidence-Based Interventions: Preliminary Results for Promoting Social-Emotional Development in Early Childhood

In this study, Baggett, Davis, Feil, Sheeber, and Landry examined a Web-based adaptation of an intervention demonstrated to increase responsive parenting behaviors and child outcomes. Using a Web-based adaptation called Infant-Net, coaches presented intervention content to mothers in a multimedia format featuring video exemplars, prompting questions, and summary text. The program also allowed mothers to record their own interactions with their

infants, which was subsequently reviewed with the coach. Findings indicate positive outcomes for both mothers and infants assigned to the Infant-Net condition. The results of the study offered promising preliminary evidence for the ability to deliver evidence-based parenting interventions with fidelity using Web-based formats.

Use of a Case-Based Hypermedia Resource in an Early Literacy Coaching Intervention With Pre-Kindergarten Teachers

In this study, Powell, Diamond, and Koehler described the use of Web-based, video-rich cases, called hypermedia resources, as a means to deliver literacy coaching intervention with teachers of preschoolers who were considered at risk. Findings support the potential of online video exemplars as cost-effective, on-demand, and valuable resource. Of important consideration, though, is that teachers' use of the resource varied widely in amount, and much of their use was independent of suggestions by a coach. The results trigger important questions for future research on factors that influence teachers' engagement in Web-based professional development resources.

Web-Based Technology Matrix

In an effort to help shape the research agenda and use of Web-based technologies across Early Intervention/Early Childhood Special Education (EI/ECSE) in-service and preservice practices, we have created a matrix that shows one approach for aligning purposes and Web-based technologies. (See Table 1.) The matrix was created through a two-step process. First, typical purposes/actions in which faculty, researchers, and EI/ECSE personnel commonly engage (e.g., collaborating, sharing, guiding, instructing) were identified. Second, a list of approximately 35 current Web-based technologies was generated and then aggregated into 9 broader categories (e.g., Skype™ was categorized under *synchronous conferencing*). The resulting matrix includes the common purposes in the left-hand column and an alphabetical listing of Web-based technology categories across the top row.

The cells of the matrix allow for alignment between common purposes and one or more Web-based technology. To specifically address the technologies represented in this special issue, first authors' names are included in the applicable cells. In addition, Xs further illustrate the alignment between a given purpose and technology. Readers can use the matrix to guide the selection and use of various Web-based technologies in personnel preparation, professional development, collaboration, practice, and in research. For example, if a faculty person wants to use a technology that facilitates giving timely feedback, they could review the

Table 1. Illustration of the alignment between intended purposes and various Web-based technologies.

Technology purpose	Collaborative spaces and synchronous conferencing	Course Management Systems (CMS)	Database management systems	Online journals and discussions platforms	Online video sharing	Podcasts and screencasts	Social networks	Virtual worlds	Wikis
Group brainstorming and planning	Gibson		Buzhardt						X
Exposure outside a geographic area	Gibson		Buzhardt	X	Baggett Powell	X		X	X
Feedback and clarification	Gibson	Baggett	Buzhardt	Baggett Buzhardt	Baggett Powell	X		X	X
Collaborative construction	Gibson		Buzhardt	Baggett	Powell		X		X
Demonstration	Gibson	X	Buzhardt	Baggett	Baggett Powell	X		X	
Formative assessment	Baggett Gibson	Baggett	Baggett Buzhardt	Baggett Buzhardt	Baggett Powell	X	X	X	X
Guided practice/coaching	Gibson		Buzhardt	Baggett	Baggett Powell			X	
Interaction with experts	Baggett Gibson	Baggett	Baggett Buzhardt	X	Baggett Powell		X	X	X
Observation	Gibson		X		X			X	
Multiple means of representation	Gibson		Buzhardt	X	Baggett Powell	X	X	X	X
Networking	X	X		X			X	X	
Self-reflection	Gibson	X	Buzhardt	Baggett Buzhardt	Powell	X	X		
Sharing or organizing text	Gibson	Baggett	Buzhardt	Baggett Buzhardt		X			X

matrix and determine which technologies might be used for that purpose. The faculty person would then be encouraged to systematically examine the impact (efficacy and efficiency) when the technology is employed. Service providers could also use the matrix to help identify possible matches between their selected purpose(s) and various Web-based technologies. For example, if a home visitor or itinerant teacher wanted to coach family members or child care providers in the use of naturalistic communication strategies, they could refer to the matrix and determine that online video sharing (e.g., YouTube, vodcasts), synchronous conferencing (e.g., TokBox), and/or online journals (e.g., blogs with videos) are Web-based technologies that are conducive to support the identified purpose.

Although the matrix includes a broad representation of available technologies, it is by no means an exhaustive list of Web-based technologies that are available for use in the field. For the matrix, we focused on free, Web 2.0 technologies, but a few (e.g., Course Management Systems) do have an associated fee. Web 2.0 technologies were emphasized given their ability to move away from static Web pages to Web-based applications that are flexible, dynamic, allow for shareable content, and enhance collaboration and social networking.

Terminology

Finally, because the vocabulary associated with Web-based technology is unique and has expanded quickly, we have included a list of terms and definitions that may be helpful in reading the articles contained in this issue and when using the matrix.

- *Asynchronous*—transmitting in a way that does not require participation to occur at the same time.
- *Collaborative spaces*—online spaces where groups of people can house, share, and/or edit video, presentations, and documents with a small group, their entire organization, or the world (e.g., Huddle, box.net, Google groups, Groove).
- *Course Management System*—online framework for developing, managing, and publishing/sharing content, group collaboration, and assessments for a course/school/agency (e.g., Blackboard, Moodle, Timecruriser).
- *Database management system*—Web-based software that supports, stores, and manages related files often for multiple users. Increasingly, real-time databases are being use to allow the

processing of information fast enough for the end user to act upon the results immediately.

- *Firewall*—part of a computer system or network that blocks unauthorized access while permitting authorized communications.
- *Online journals and discussion platforms*—Web sites where individuals or groups can share reactions, perspectives/commentaries, and descriptions of events (Blogspot.com, Techcrunch, CMS-threaded discussion boards). Many Web 2.0 sites also allow users to share graphics and video.
- *Online video sharing*—Web-based spaces that allows users to upload and view videos (e.g., YouTube, TeacherTube, Photo Story, ourmedia, Veoh, Qik, Google videos).
- *Podcasts*—audio files (typically within a series) that are distributed over the Internet for playback on a mobile device or a personal computer (e.g., iTunes, iTunesU).
- *Screencasts*—digital recording of a user's computer screen for the purpose of demonstrating or providing a tutorial, particularly when paired with audio (e.g., Jing, Screentoaster).
- *Social networks*—Web-based sites/applications that allow individuals or groups to connect and share information related to friendship, personal experiences, shared interests, and so on (e.g., Ning, My Space, Facebook, Twitter).
- *Synchronous*—occurring or existing at the same time.
- *Videoconference*—a discussion conducted between people in separate locations across a telecommunications link with audio and, increasingly, with video (e.g., Skype™, ooVoo, Google Talk, TokBox, Dimdim, WebEx, AlmostMeet). Many synchronous conferencing systems are also paired with a course management system to allow for live and on-demand sharing and collaboration (e.g., Elluminate, Wimba, AMVONET Integrated Education Network™).
- *Virtual worlds*—simulated environments/worlds where avatars are used to participate in any event or action that takes place in first life/reality (e.g., Second Life, activeworlds, SpotON3D).
- *Vodcasts*—multimedia files that are distributed over the Internet for playback on a mobile device or a personal computer.
- *Wiki*—Web sites that allows multiple users to easily create and edit content online (e.g., Wikipedia, GoogleDocs, Etherpad.com, pbworks, wikispaces) using a *what you see is what you get* (WYSIWYG) text editor or simplified mark-up language.